Programmable current limiting using a shunt resistor

ABSTRACT

An overcurrent protection circuit using a shunt resistor and the voltage drop across a switch to program a user-defined current limiting level. This protects the switch and the input power supply, as well as the load. The shunt resistor is connected to the input or output of the switch, and a temperature dependent current source, so that a voltage drop is generated across the shunt resistor. An amplifier is used to sense the voltage across the shunt resistor and the voltage drop across the switch. When the voltage drop across the switch exceeds the voltage drop across the shunt resistor, the amplifier will regulate the switch so that a voltage drop across the switch is equal to the voltage drop across the shunt resistor. In this way, a constant current through the switch can be achieved. A constant ratio between the current limiting level to the shunt resistor value can be achieved with this method, so the current limiting level is programmable by selecting the resistor value.